CLAIMS

[0057] The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A challenge medium for assessing the condition of an organ, wherein the challenge medium exhibits a viscosity of about 1,000 centipoise to about 100,000 centipoise, measured at 30 rpm using a Brookfield Viscometer, LVT model, with a number-4 spindle, and an electrical conductivity of about 2.3 mS/cm to about 11 mS/cm, wherein the.

2. The challenge medium of claim 1, wherein the viscosity ranges from about 5,000 to about 50,000 centipoise.

3. The challenge medium of claim 1, wherein the viscosity ranges from about 6,000 to about 20,000 centipoise.

4. The challenge medium of claim 1, wherein the electrical conductivity ranges from about 4.0 to about 7.0 mS/cm.

5. The challenge medium of claim 1, further being thixotropic.

6. The challenge medium of claim 5, exhibiting a decrease in viscosity at least by about 20-fold over a two-decade increase in the rotation velocity of the viscometer spindle.

7. The challenge medium of claim 6, exhibiting a decrease in viscosity at least by about 30-fold over a two-decade increase in the rotation velocity of the viscometer spindle.

8. The challenge medium of claim 1, further having a pH of about 3.5 to about 9.0.

9. The challenge medium of claim 8, having a pH of about 4.0 to about 9.0.

10. The challenge medium of claim 9, having a pH of about 4.5 to about 8.0.

11. The challenge medium of claim 1, further being substantially non-sticking to stainless steel.

12. The challenge medium of claim 1, comprising a thickening agent and an ion donor.

13. The challenge medium of claim 12, wherein the thickening agent comprise a polysaccharide.

14. The challenge medium of claim 13, wherein the polysaccharide comprises carrageenan.

15. The challenge medium of claim 12, wherein the ion donor comprises sodium chloride.

16. The challenge medium of claim 12, further comprising a preservative.

17. A method of measuring the physiological functions of an organ, the method comprising:

introducing a predetermined quantity of a challenge medium into the organ;

selecting a plurality of pairs of locations along a path in the organ;

measuring the impedance between each pair of positions; and

determining the location of the challenge medium along the path as a function of time.

18. The method of claim 17, wherein the step of introducing a challenge medium comprises introducing a challenge medium exhibiting a viscosity of about 1,000 centipoise to about 100,000 centipoise, measured at 30 rpm using a Brookfield Viscometer, LVT model, with a number-4 spindle, and an electrical conductivity of about 2.3 mS/cm) to about 11 mS/cm.

19. The method of claim 18, further comprising determining the pressures at a plurality of locations along the path in the organ as a function of time and comparing the location of the challenge medium along the path with pressure along the path as a function of time.

20. The method of claim 19, further comprising repeating the steps therein a plurality of times and comparing the results with a standard.

21. A method of testing peristalsis and bolus transit in a person's esophagus comprising:

positioning a probe comprising a plurality of electrodes in longitudinally spaced relation to each other in the person's esophagus;

having the person swallow a swallow challenge medium that has viscosity in a range of 1,000 to 100,000 centipoise (high shear), conductivity in the range of 3.8 to 7.6 mS/cm, and sufficient surface tension to cause the swallow challenge medium to clear sufficiently from surfaces of the electrodes and probe as the swallow challenge medium passes the electrodes and probe such that impedance measurements across the electrodes after the swallow challenge medium passes the electrodes is not less than 50% of impedance measurements across the electrodes before the challenge medium reaches the electrodes;

measuring impedance across the electrodes on a real time basis as the challenge medium moves though the esophagus, and

recording the impedance measurements as a function of time.

22. The method of claim 21, wherein the surface tension is sufficient such that said drop in impedance is not more than 1%.

23. The method of claim 21, wherein the swallow challenge medium is thixotropic.

24. The method of claim 21, wherein the swallow challenge medium has conductivity in a range of 4.5 to 7.6 mS/cm.

25. The method of claim 21, wherein the swallow challenge medium provides impedance in a range of 300 to 600 ohms.

26. The method of claim 21, wherein the swallow challenge medium provides impedance in a range of 300 to 500 ohms.

27. The method of claim 21, wherein the swallow challenge medium has pH in a range of 3.5 to 9.0.

28. A method of testing peristalsis and bolus transit in a person's esophagus, comprising:

positioning a plurality of electrodes in longitudinally spaced relation to each other in a person's esophagus;

having the person swallow a thixotropic swallow challenge medium that has low shear viscosity in a range of 391,000 to 529,000 centipoises, medium shear viscosity in a range of 76,500 to 103,500 centipoises, and high shear viscosity in a range of 11,475 to 15,525 centipoises; and

measuring impedance across the electrodes as the swallow challenge medium moves through the esophagus.

29. The method of claim 28, wherein the swallow challenge medium has conductivity in a range of 4.8 to 6.6 mS/cm.

30. The method of claim 28, wherein the swallow challenge medium has an impedance in a range of 340 to 460 ohms.

31. The method of claim 28, wherein the swallow challenge medium has pH in a range of 3.8 to 5.2.

32. A swallow challenge medium comprising a thixotropic material having a low shear viscosity in a range of 391,000 to 529,000 centipoises, a medium shear viscosity in a range of 76,500 to 103,500 centipoises, and a high shear viscosity in a range of 11,475 to 15,525 centipoises.

33. The swallow challenge material of claim 32, wherein the material also has conductivity in a range of 4.8 to 6.6 mS/cm.

34. The swallow challenge material of claim 32, wherein the material also has impedance in a range of 340 to 460 ohms.

35. The swallow challenge material of claim 32, wherein the material also has pH in a range of 3.8 to 5.2.